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AH174

Inverted Output Hall Effect Latch For High Temperature

■ Features

- Bipolar Hall effect latch sensor
- 3.5V to 20V DC operation voltage
- Open collector pre-driver
- 25mA output sink current
- Chip power reverse-connection protection
- Operating temperature: –40°C ~ +125°C
- Package: SIP3, SOT23

■ Applications

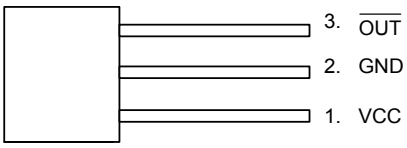
- Rotor position sensing
- Current switch
- Encoder
- RPM detection

■ General Description

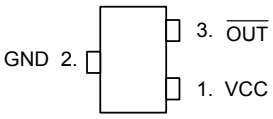
AH174 is a single-digital-output Hall-effect sensor for high temperature operation. The device includes an on-chip Hall voltage generator for magnetic sensing, an amplifier to amplify Hall voltage, and a comparator to provide switching hysteresis for noise rejection, and an open-collector output pre-driver. An internal bandgap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range. While the magnetic flux density (B) is larger than threshold Bop, the $\overline{OUT}$ pin turns off (High). If B removed toward Brp, the $\overline{OUT}$ pin is latched "off" state prior to B < Brp. When B < Brp, the $\overline{OUT}$ pin go into " on " state.

■ Pin Assignment

(Top view)



(SIP3 package)

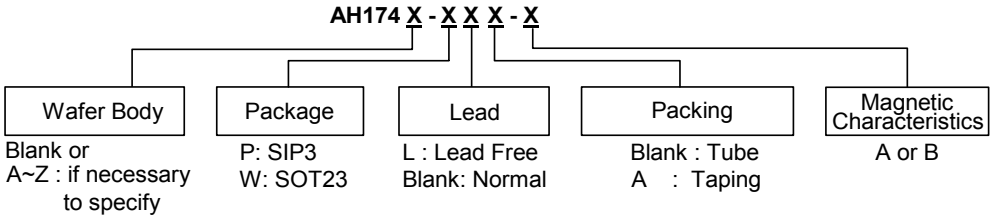


(SOT23 package)

■ Pin Descriptions

Name	Description
VCC	Input power
GND	Ground
$\overline{OUT}$	Inverted output stage

■ Ordering Information



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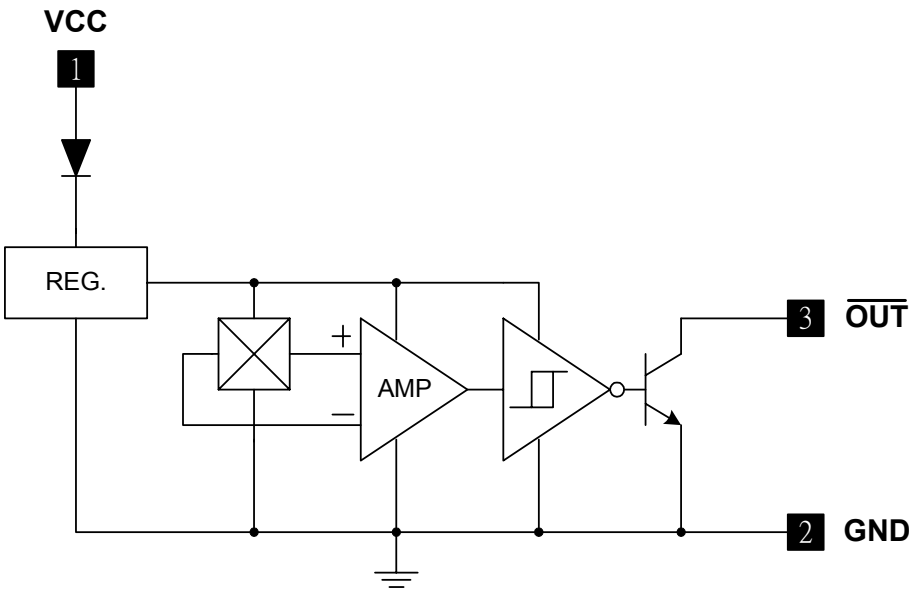
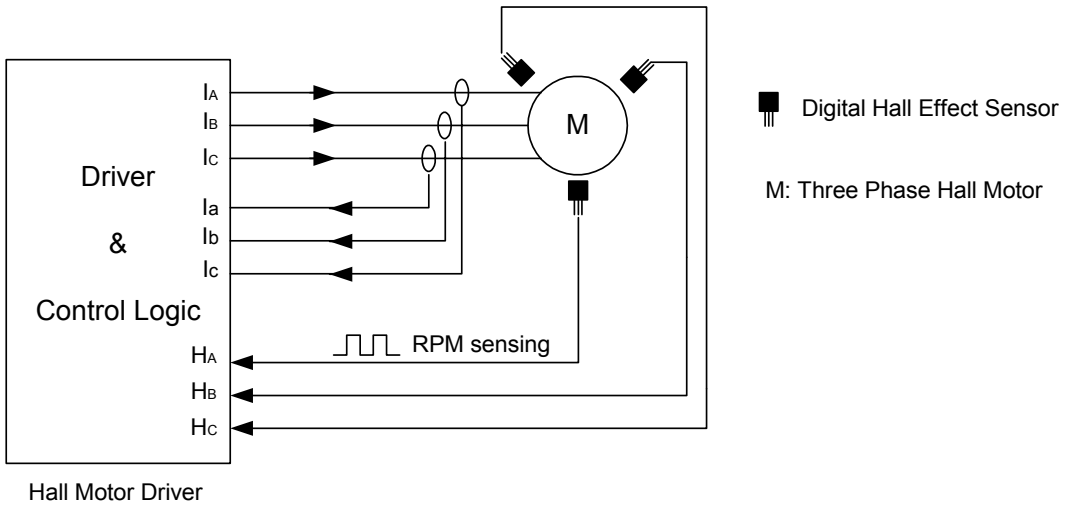
■ Block Diagram



■ Application Circuit



Three Phase Hall Motor

■ Absolute Maximum Ratings (at Ta= 25°C)

Characteristics		Symbol	Rating	Unit
Supply voltage		VCC	20	V
Output "off " voltage		$V_{out\ (off)}$	20	V
Output "on" current		$I_{o\ (sink)}$	25	mA
Operating Temperature range		T_{opt}	-40~+125	°C
Storage Temperature range		T_{stg}	-65~+150	°C
Power Dissipation	SIP	PD	550	mW
	SOT23		230	mW

■ Electrical Characteristics (Ta= 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage	Vcc	—	3.5	-	20	V
Output saturation voltage	Vout(sat)	VCC=12V, $\overline{OUT}$ "ON" Io =10mA	-	300	400	mV
Supply current	Icc	VCC=12V, $\overline{OUT}$ "OFF"	-	3.5	6	mA

■ Magnetic Characteristics (Ta= 25°C)

(1mT = 10 Gauss)

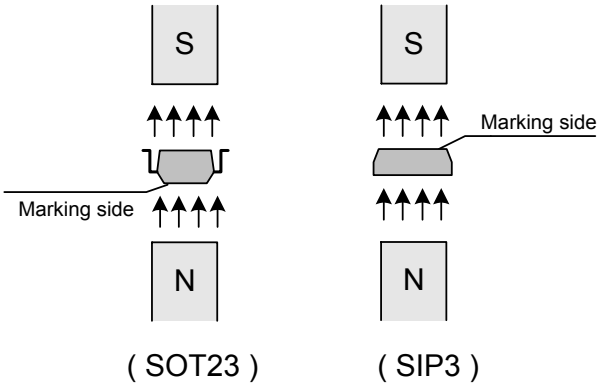
A grade

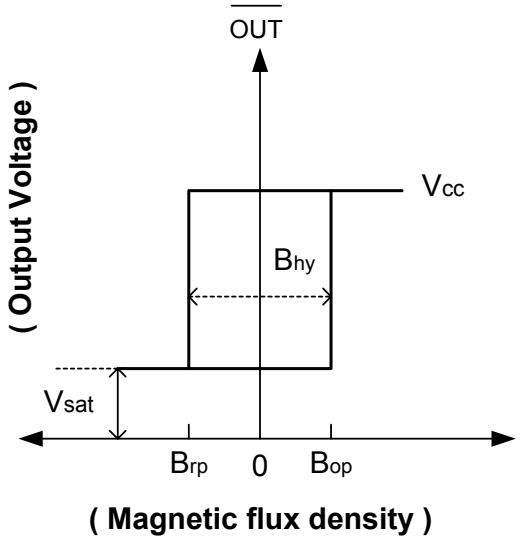
Parameter	Symbol	Min.	Typ.	Max.	Unit
Operate Point	Bop	15	-	60	Gauss
Release Point	Brp	-60	-	-15	Gauss
Hysteresis	Bhy	-	80	-	Gauss

B grade

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operate Point	Bop	5	-	80	Gauss
Release Point	Brp	-80	-	-5	Gauss
Hysteresis	Bhy	-	80	-	Gauss

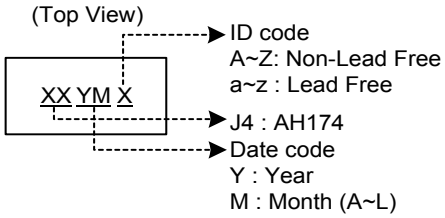
■ Operating Characteristics



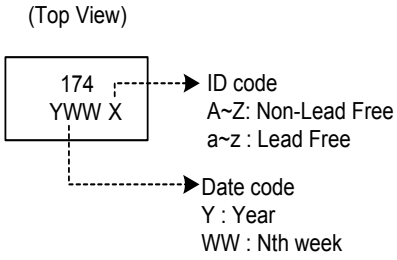


■ Marking Information

(1) SOT23

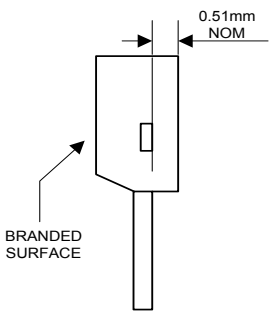


(2) SIP3

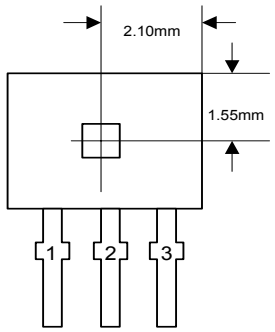


■ Package Information

(1) Package Type: SIP-3L

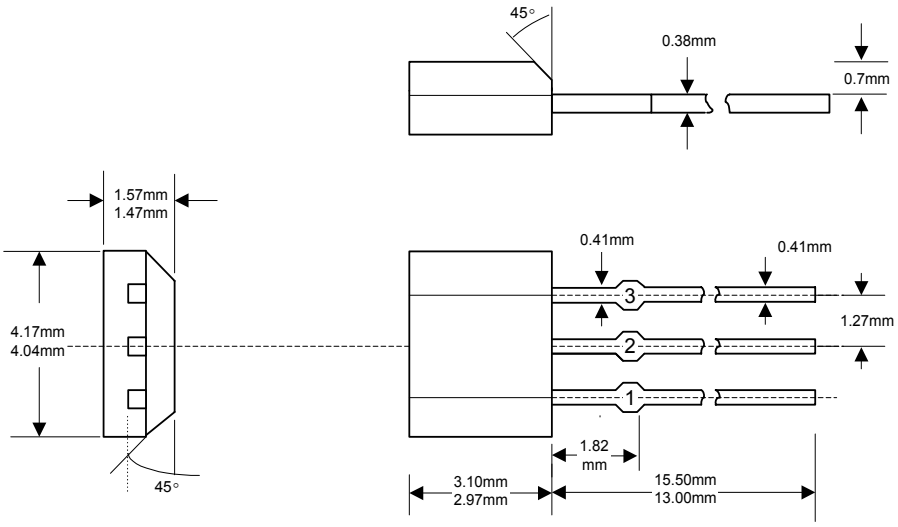


Active Area Depth

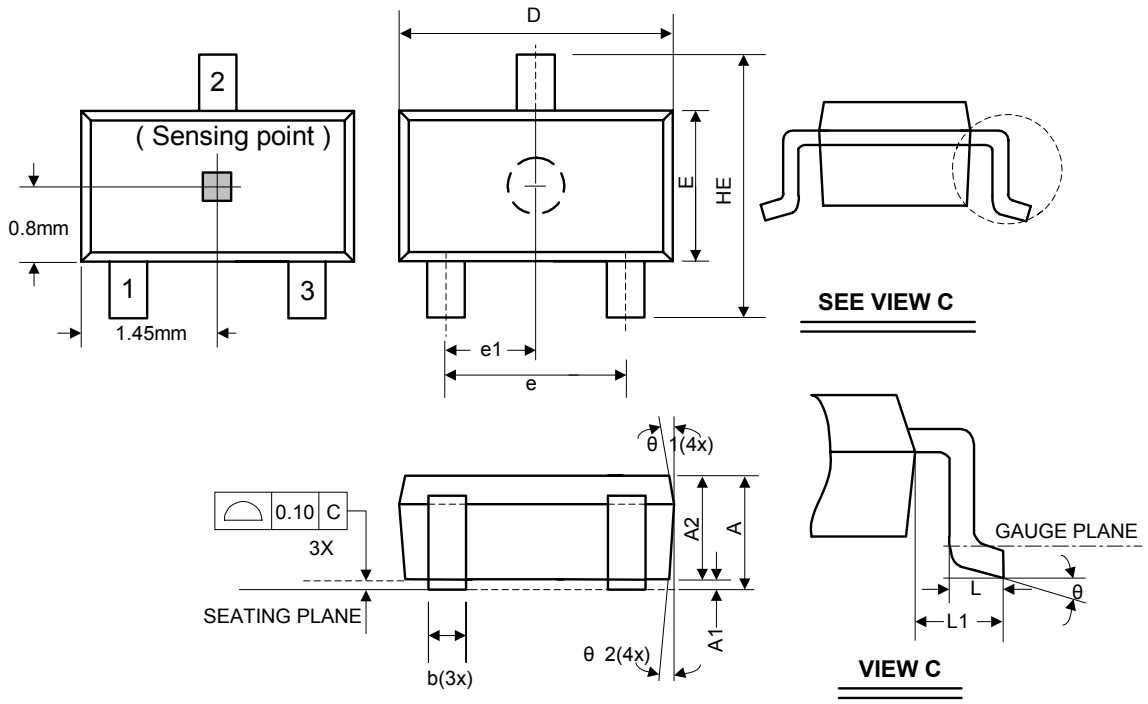


Sensor Location

Package Dimension



(2) Package Type: SOT23-3L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.05	-	1.35	0.041	-	0.053
A1	0.05	-	0.15	0.002	-	0.006
A2	1.00	1.10	1.20	0.039	0.043	0.047
b	0.25	-	0.50	0.010	-	0.020
C	0.08	-	0.20	0.003	-	0.008
D	2.70	2.90	3.00	0.106	0.114	0.118
E	1.50	1.60	1.70	0.059	0.063	0.067
HE	2.60	2.80	3.00	0.102	0.110	0.118
L	0.30	-	0.55	0.012	-	0.022
L1	0.50	0.60	0.70	0.020	0.024	0.028
e	1.80	1.90	2.00	0.071	0.075	0.079
e1	0.85	0.95	1.05	0.033	0.037	0.041
θ	0^o	5^o	10^o	0^o	5^o	10^o
θ1	3^o	5^o	7^o	3^o	5^o	7^o
θ2	6^o	8^o	10^o	6^o	8^o	10^o